



U. S. Chemical Safety and Hazard Investigation Board

RECOMMENDATIONS STATUS CHANGE SUMMARY

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| Report: | Carbide Industries Fire and Explosion |
| Recommendation Number(s): | 2011-5-I-KY-R3 |
| Date Issued: | February 7, 2013 |
| Recipient: | Carbide Industries |
| New Status: | Open – Acceptable Response or Alternate Response |
| Date of Status Change: | August 12 th , 2015 |

Recommendation Text(s):

Implement a mechanical integrity program for the electric arc furnace and cover, including preventive maintenance based on periodic inspections, and timely replacement of the furnace cover. At a minimum, the program should include factors such as leak detection and repair and refractory lining wear.

Board Status Change Decision:

A. Rationale for Recommendation

On March 21, 2011, two workers at Carbide Industries, LLC in Louisville, Kentucky, sustained fatal injuries after hot gases and debris blown from the electric arc furnace broke through the double-pane reinforced glass window of the control room, which was located only 12 feet from the furnace. A third worker was injured. The CSB's investigation found that furnace overpressure events, or "blows", occurred at the facility a few times a year, but found no evidence that these incidents were investigated to determine their root causes or to prevent their recurrence. The CSB also concluded that water leaks into the furnace could contribute to overpressurization events; however, Carbide did not have a robust inspection and mechanical integrity program for the furnace and its cover. As a result, the CSB issued a recommendation that Carbide Industries develop and implement a mechanical integrity program for the electric arc furnace that included inspection of leaks and refractory lining wear.

B. Response to the Recommendation

Carbide has stated that it will inspect the furnace cover every 6.5 years (rather than every 10 years), and will replace the cover at that time, if needed. In addition, Carbide will taken action in between that period should the cover indicate substantial wear. Carbide has indicated that refractory lining is inspected daily and monthly and more in depth during the annual shutdown. The furnace is now equipped with several water leak alarms. In addition, Carbide has changed its water treatment process for non-contact water cooling to detect any deposit build up.

The CSB believes that Carbide has taken positive steps towards implementing a mechanical integrity program; however, there are several remaining aspects that Carbide should address prior to closing this recommendation. Although Carbide has indicated that they inspect the refractory lining daily, CSB is awaiting documentation of alarm and inspection procedures. In addition, CSB staff has some concerns regarding Carbide's management of water alarms, and has requested that supplemental controls be added to the procedures.

C. Board Analysis and Decision

As Carbide has taken positive steps to implement a mechanical integrity program, the Board voted to change the status of Recommendation No. **2011-5-I-KY-R3** to **“Open – Acceptable Response or Alternate Response.”**